Section 7. Radiometric Processing Subsystem

7.1 Introduction

The Radiometric Processing Subsystem (RPS) processes L0R image data to produce Level-1 radiometrically corrected (L1R) images.

The RPS is being developed external to the LPGS development by the Algorithm Implementation Team (AIT) for IAS and LPGS. RPS is considered a black box by the LPGS implementation team.

Information presented in this section is intended to provide the LPGS development team's understanding of the RPS. (For further information on the RPS design, refer to the IAS Critical Design Specification.)

7.2 Design Overview

This section provides an overview of the RPS software design. The relationship between the RPS and other LPGS subsystems is presented, along with a discussion of the assumptions, constraints, and considerations used in the design process.

7.2.1 Subsystem Software Overview

Figure 7–1 contains the context diagram of the RPS.

The RPS interfaces with the PCS, and LPGS system files. The RPS receives processing parameters (Proc_Parms) from the PCS and returns processing status (Proc_Status) to PCS. The RPS writes completed L1R image data to the Image_Processing_Files. The RPS Image_Processing_Files are accessed by the QAS for quality assessment and AAS for error analysis.

The RPS performs radiometric calibration and L1R processing. The purpose of radiometric calibration is to determine the calibration in-flight of each detector, that is, the conversion from digital number to absolute radiance. The primary purpose of the L1R processing is to convert the brightness of the image pixels to absolute radiance, and is done prior to Level-1 geometric processing. This process uses various ground and in-flight determined calibrations. Another function of L1R processing is to characterize the quality and various features of the data.

7.2.2 Design Considerations

The RPS is being developed initially for, and under the direction of, the IAS project by the AIT. The LPGS system engineer's are monitoring the development of the RPS to ensure that the LPGS's requirements are being met; where they differ from the IAS requirements. Differences between the LPGS and IAS requirements for RPS are minor.
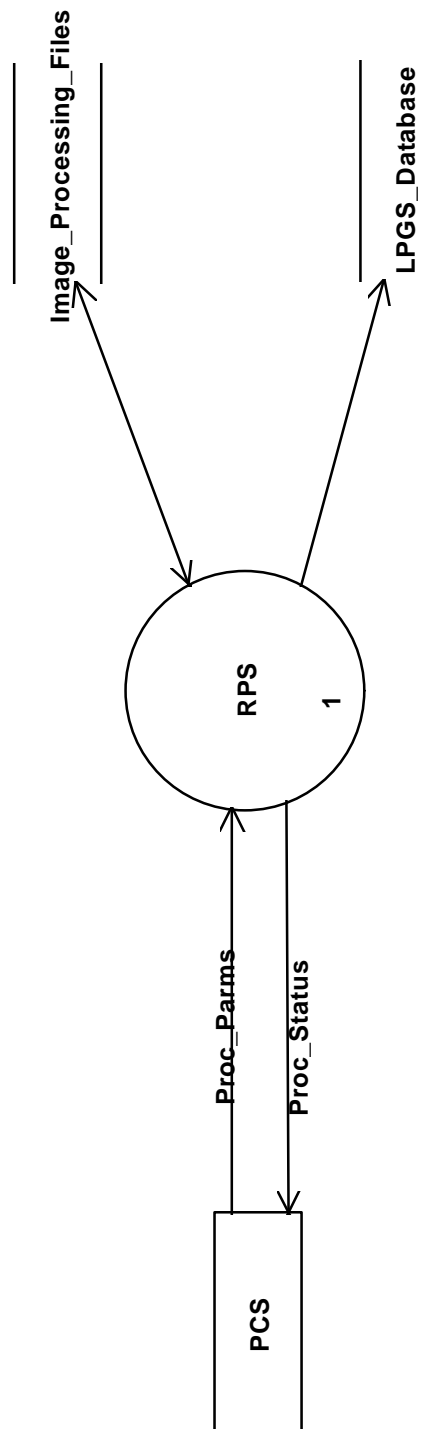
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Figure 7–1. *RPS Context Diagram*

7.2.2.1 Design Assumptions

The following assumptions were made in reusing the RPS:

- The RPS will seamlessly integrate into the LPGS.

- The RPS will include all radiometric processing functionality required by the LPGS.

- Each LPGS work order will have a unique directory that contains three subdirectories: the input, intermediate, and output. RPS will be able to access these directories.

- Thresholds for the LPGS ingest process will be configurable by the operator. The RPS will be capable of accessing these user inputs.

- The RPS will be able to meet LPGS processing performance requirements for production of the L1R images.

- The RPS will meet LPGS processing volume requirements for the production of the L1R images.